Central Lincoln People's Utility District

Smart Grid Team 2020 Program

Abstract

Central Lincoln People's Utility District (Central Lincoln PUD) is deploying advanced metering infrastructure (AMI) and distribution automation assets as part of their Smart Grid Team 2020. The AMI project consists of a system-wide deployment of smart meters to both commercial and residential customers as well as a communications infrastructure to gather the smart meter data. The two-way communication provided by the AMI allows Central Lincoln PUD to deploy direct load control devices and pricing programs, helping to lower peak demand through increased customer awareness. In addition to the AMI, Central Lincoln PUD is also upgrading its electric infrastructure with an improved supervisory control and data acquisition (SCADA) system, installation of an outage management system, automated distribution feeder controls, and regulators. The enhancements improve power quality, system reliability, and system efficiency.

Smart Grid Features

Communications infrastructure includes a mesh radio frequency and fiber optic cable network connecting the system-wide deployment of smart meters. The network provides the necessary communication to enable smart grid features such as advanced pricing programs and increased customer usage awareness. The distribution automation deployment is being supported by a fiber optic network connecting all substations to the control center. Distribution automation devices located on the feeders are connected back to the substations via a high-speed wireless connection.

Advanced metering infrastructure includes the system-wide deployment of over 38,000 smart meters to residential, commercial, and industrial customers. The smart meters enable two-way data transfer between the end users and the utility, providing the necessary functionality for smart grid programs. Residential meters are equipped with remote service disconnect and wireless home area networks.

Advanced electricity service options offered through the project include customer Web portals for all customers receiving smart meters and in-home displays for 5,000 customers. The two-way

At-A-Glance

Recipient: Central Lincoln People's Utility District

State: Oregon

NERC Region: Western Electricity Coordinating Council

Total Budget: $19,873,900

Federal Share: $9,936,950

Project Type: Integrated and/or Crosscutting Systems

Equipment

- 38,283 Smart Meters
- AMI Communication Systems
  - Meter Communications Network
  - Backhaul Communications
- Meter Data Management System
- Customer Web Portal Access for All Customers
- 5,000 In-Home Displays
- 5,000 Direct Load Control Devices
- Distribution Automation Equipment for 13 out of 80 Circuits
  - Distribution Automation Communications Network
  - SCADA Communications Network
  - Automated Distribution Circuit Switches
  - Automated Capacitors
  - Automated Regulators
  - Circuit Monitors/Indicators

Time-Based Rate Programs

- Time of Use
- Critical Peak Pricing

Key Targeted Benefits

- Reduced Meter Reading Costs
- Reduced Operating and Maintenance Costs
- Reduced Electricity Costs for Customers
- Improved Electric Service Reliability and Power Quality
- Reduced Costs from Distribution Line Losses and Theft
- Reduced Truck Fleet Fuel Usage
- Reduced Greenhouse Gas and Criteria Pollutant Emissions

Central Lincoln People's Utility District *(continued)*

information exchange between the customers and the utility provided by these devices enable customers to better manage their electricity use and costs.

Direct load control devices deployed by the project include 5,000 devices connected through the newly deployed smart meters. The direct load control devices connect to selected appliances and control the appliances' energy use in exchange for rebates offered to the customers. The direct load control devices lower customers' electricity bills and peak demand. Central Lincoln PUD has finalized a time-of-use purchasing agreement with the Bonneville Power Authority, increasing its ability to reduce its peak energy purchasing and reducing energy purchasing costs.

Time-variant pricing programs include time-of-use pricing and critical peak pricing programs. These programs aim to reduce peak demand.

Distribution automation systems include the deployment of automated feeder line sectionalizing switches, which allow feeders to be reconfigured remotely to reduce the affected area in the event of a fault or to handle unexpected changes in electricity demand. These assets working together improve distribution system reliability, stability, and operational efficiency.

Distribution system energy efficiency improvements include the implementation of conservation voltage regulation. Automated regulators deployed at the substations enable the conservation voltage regulation and allow for more efficient power distribution and improved power quality delivered to the customers.

Consumer Behavior Study

Under development.

Timeline

Key Milestones	Target Dates
AMI asset deployment begins	Q2 2010
Distribution automation asset deployment begins	Q4 2010
Distribution automation asset deployment complete	Q4 2012
AMI asset deployment complete	Q4 2012

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